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## A FINANCIAL SYSTEM OF COMPUTERS

Background of the Invention:

This is a continuation of United States Patent application serial number 09/166,749 filed on October 5, 1998, and entitled "Financial System of Computers", now United States Patent number 5,963,917, issued on October 5, 1999, which was a continuation of United States Patent application serial number 08/597,017, entitled "An Improved Financial Transactions System" filed February 5, 1996, now United States Patent number 5,822,737, issued on October 13, 1998.

This invention relates generally to financial transactions and more particularly to transactions involving credit or debit cards.

The time is fast approaching where a significant amount of commerce will be conducted using distributed networks of computers such as the Internet. The reason this ground-swell of commerce will occur is the ability of a single merchant to economically reach a vast number of potential customers at substantially no costs. Further, the customers are able to review a great number of vendors and their products with the ease of a few key strokes and clicks of the mouse.

Although there are vast numbers of merchants already using

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1 such networks, the sales volume has been particularly low due to  
2 a variety of reasons. One reason which has depressed commerce on  
3 the networks, is the difficulty with which customers can pay for  
4 their purchases.

5 A variety of techniques have been developed to cure this  
6 problem ranging from accepting phone orders to the establishment  
7 of another currency called "E-Cash".

8 Phone orders in response to merchant promotional materials  
9 creates a variety of problems. One major problem is the  
10 requirements for phone lines and personnel to receive and process  
11 the phone orders. Another hurdle is the simple fact that most  
12 customers have a single phone line to their residence and this  
13 line is used by the computer for accessing the network; the  
14 customer has to disconnect from the network to make the phone  
15 order.

16 Although E-Cash is a viable alternative, it is faced with  
17 some enormous problems which will be difficult or impossible to  
18 address. These include: counterfeiting problems; government  
19 reluctance to accept the concept; difficulties in getting access  
20 for handling E-Cash; and, the low number of users and merchants  
21 which can use E-Cash.

22 It is clear from the foregoing that there is a need for an  
23 efficient methodology and system to accept payment over  
24 distributed computer networks.

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1 Summary of the Invention:

2       The present invention contemplates a totally automated  
3 system for securing payment via a distributed network of  
4 computers. In this context, the invention creates an automated  
5 payment system particularly suited for purchases over a network  
6 such as the Internet.

7       Although the present invention is described relative to the  
8 Internet, its application is not so limited and is intended to be  
9 used on any distributed computer system in which merchants and  
10 consumers interact for the purpose of supplying and purchasing  
11 goods or services.

12       In such a distributed computer network, a merchant or  
13 vending computer contains certain promotional information which  
14 is communicated to a customer's computer. This information is  
15 intended to give the customer sufficient information to make a  
16 decision on if the goods/services are acceptable.

17       As used within this discussion, the term "merchant computer"  
18 signifies a computer system which is used for the purpose of  
19 selling goods or services. The vendor itself does not  
20 necessarily own the computer; in some situations, the computer is  
21 operated on behalf of the merchant or vendor.

22       Based upon the promotional information, the  
23 consumer/operator of the customer's computer decides to purchase  
24 the services or goods described by the promotional information.

25       It is at this point where the present invention is

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1 particularly powerful as it provides a simple, easy, methodology  
2 and linkage for the customer to pay for the goods/services.

3 In this context, the customer's computer is linked to a  
4 payment processing computer and the customer's credit card number  
5 and the amount of the goods or services is transmitted to the  
6 payment processing computer. For security reasons, an encrypting  
7 software package is first downloaded to the customer's computer  
8 so that the credit card number is secure from "hackers" who might  
9 also be on the network.

10 Although the term "credit card" is used, the invention  
11 covers the use of any type of financial guarantee card such as  
12 automatic debit accounts, checking account numbers, savings  
13 account numbers, and other such devices obvious to those of  
14 ordinary skill in the art.

15 The payment processing computer automatically contacts a  
16 bank for verification of the credit card and amount; the bank  
17 transmits an authorization to the payment processing computer.  
18 This authorization, usually in the form of a number, is stored  
19 within the payment processing computer's memory for later  
20 reference.

21 The link or connection with the bank is terminated by the  
22 payment processing computer and the payment processing computer  
23 turns its attention to the customer's computer. The payment  
24 processing computer communicates a self-generated transaction  
25 indicia, and in some embodiments a password, to the customer's

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1 computer.

2 The transaction indicia is generated by the payment  
3 processing computer, for proper record keeping. The transaction  
4 indicia is also used by the customer to verify that an order has  
5 been generated and accepted.

6 The password is defined by the merchant's computer for the  
7 payment processing computer to pass along to the customer's  
8 computer. The password is used by the customer's computer to  
9 gain access to restricted material within the merchant's  
10 computer.

11 As example, assume the merchant's computer is supplying  
12 information as to genealogy. As an initial process, the customer  
13 enters the name being researched and receives a preliminary  
14 report on the genealogy (the promotional material). To proceed,  
15 though, and get the actual data, the customer must pay to access  
16 this further information.

17 To do so, the customer links with the payment processing  
18 computer, and in the manner outlined above, receives back the  
19 transaction indicia and the password. The payment processing  
20 computer links the customer computer back to the merchant  
21 computer; the customer provides the password to the merchant's  
22 computer and is given access to the full genealogy report.

23 As outlined in this example, in the embodiment where a  
24 password is used, the customer's computer uses the password with  
25 the merchant's computer in obtaining access to protected

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1 information or to establish shipping instructions.

2       The re-linking of the customer computer to the merchant  
3 computer is accomplished in a variety of ways. In the preferred  
4 embodiment, the payment processing computer obtains the  
5 merchant's address or Unique Recognition Location (URL) from the  
6 customer computer when the customer connects with the payment  
7 processing computer. This URL is used in a variety of ways, to  
8 identify the merchant, to establish the amount of the  
9 product/service, and to establish the return URL when the payment  
10 processing computer is done with its task for the customer  
11 computer.

12       By selective use of the URL on the merchant's part, the URL  
13 transmits a tremendous amount of information to the payment  
14 processing computer. As example, assume the URL for the home-  
15 page of the merchant is: merchant.com/widget.

16       When the merchant is selling a single product (a widget),  
17 this URL is easy to match to the product. When the merchant  
18 wants to sell a variety of widgets, then for a blue widget, the  
19 URL might be: merchant.com/widget/blue.

20       In some embodiments, the customer's computer is not linked  
21 back to the originating URL of the Merchant computer but rather  
22 to another URL. The return URL is stored in the payment  
23 processing computer and is used when the Merchant wants the  
24 customer/consumer to be passed back to a different location (i.e.  
25 where the restricted access information is accessible, or to

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1 inform the consumer that their card has been rejected).

2       The invention, together with various embodiments thereof,  
3 will be more fully explained by the accompanying drawings and the  
4 following descriptions.

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1 Drawings in Brief:

2        Figures 1A and 1B are block diagrams of the two computer  
3 configurations used in the preferred embodiment.

4        Figure 1C is a graphical representation of the preferred  
5 memory organization for the computer illustrated in figure 1A.

6        Figures 2A, 2B, 2C, 2D, and 2E graphically illustrate the  
7 connections and disconnections of the preferred order.

8        Figures 3A, 3B, 3C, and 3D are frontal views of one  
9 embodiment of a consumer's display screen.

10       Figure 4A is a flow-chart of the preferred embodiment's  
11 payment processing operation.

12       Figure 4B is a flow-chart of an alternative embodiment's  
13 payment processing operation.

14       Figure 5 is a flow-chart of the operation of the merchant's  
15 computer.



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1 Drawings in Detail:

2        Figures 1A and 1B are block diagrams of the two computer  
3 configurations used in the preferred embodiment.

4        Figure 1A illustrates the configuration of the preferred  
5 payment processing computer. As shown, computer 10A is a simple  
6 layout of a Central-Processing-Unit (CPU) 11A which uses both  
7 non-volatile memory 12A and Random-Access-Memory (RAM) 13A.

8        Communication to and from CPU 11A is via modem 14A which  
9 communicates with other computers via the network connected by  
10 phone line 15A.

11        Computer 10B, illustrated in figure 1B, shows the preferred  
12 computer configuration used for the merchant computer and the  
13 customer computer. Again, CPU 11B is connected to memories RAM  
14 13B and non-volatile memory 12B. In the case of the merchant  
15 computer, the promotional material is stored on non-volatile  
16 memory 12B and is retrieved and communicated by CPU 11B using  
17 modem 14B and phone line 15B.

18        This system is able to communicate with an operator via  
19 monitor 16 for visual information. Monitor 16 is used for the  
20 perusal of the promotional material by the customer.

21        Keyboard 17 is used to communicate operator commands to CPU  
22 11B. In like fashion, mouse input device 18 is also used for  
23 operator input to CPU 11B.

24        Optional printer 19 is used to create a hard copy of the  
25 material being displayed to the operator/customer via monitor 16.

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1       The differences between the computers shown in figure 1A and  
2       1B are pronounce since the payment processing computer of figure  
3       1A does not require input or direction from a human operator.  
4       Rather, in the preferred embodiment, the payment processing  
5       computer runs totally automatically and collects all of the data  
6       and information it requires for its operation automatically from  
7       the computers with which it is linked and with what is stored in  
8       its memory.

9       Figure 1C is a graphical representation of the preferred  
10      memory organization for the computer illustrated in figure 1A.

11      Memory 9, located preferably in non-volatile memory 12A, has  
12      three sections. The first section 8A is the product listing  
13      reference which is composed of multiple groupings. This data  
14      remains relative constant and is defined by the merchant. Each  
15      grouping, such as 7A, includes data identifying:

16             Part Number

17             Merchant Identification

18             Cost of Product/Service

19             Description of the Product/Service

20             Authorized Return URL

21             Rejected Return URL

22             Password

23      The second section is for defining the merchant's  
24      information. Each grouping 7B within section 8B contains  
25      relative constant information such as:

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1 Merchant Identification  
2 Business Name  
3 Contact Name within the Business  
4 Business Address  
5 E-Mail address for the Business  
6 Bank Checking Number for the Business

7 The third section 8C is an accounting listing which is  
8 constantly up-graded as new payments are processed. This section  
9 is used for making full accounting to the various merchants.

10 Grouping 7C within section 8C contain:

11 Transaction Number  
12 Date of transaction  
13 Amount of the transaction  
14 Part number involved in transaction  
15 Credit Card Number  
16 Authorization Number

17 The authorization number is the indicia received from the  
18 bank indicating that the credit card charge has been accepted.

19 The use of memory 9 allows the payment processing computer  
20 to have access to the necessary information to handle the linkage  
21 and perform the proper accounting.

22 Figures 2A, 2B, 2C, 2D, and 2E graphically illustrate the  
23 connections and disconnections of the preferred order.

24 Referring to figure 2A, in a typical fashion, a consumer via  
25 customer computer 21 enters the network 20 and searches through

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1 various merchant computers until the consumer locates the  
2 merchant of choice and connects with merchant computer 22.  
3 Merchant computer 22 communicates the promotional material via  
4 network 20 to customer computer 21.

5 When the consumer decides to buy the service or product from  
6 merchant 22, as shown in figure 2B, the link with merchant  
7 computer 22 is broken and customer computer 21 links with the  
8 payment processing computer 23. In the change from merchant  
9 computer 22 to payment processing computer 23, an indicia of the  
10 URL or the product being promoted by merchant computer 22 is  
11 communicated to the payment processing computer 23.

12 The indicia as a URL of the last site is available through  
13 normal network operations and its handling is obvious to those of  
14 ordinary skill in the art. The product number is easily  
15 combined with the URL; thereby making the product number also  
16 available to the payment processing computer 23.

17 In some embodiments, the originating URL is crossed checked  
18 to a memory data base to achieve the product number. In this  
19 embodiment, the merchant structures its material so that only a  
20 single product/service is associated with a specific URL.

21 Using the product number (or developing the product number  
22 from the merchant's URL), the payment processing computer is able  
23 to cross reference its own memory (as described earlier) to  
24 achieve other important information including: the amount of the  
25 product/service, a description of the product/service, the name

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1 and address of the merchant, and other which will be used in  
2 later operations.

3 The payment processing computer 23 accepts from the customer  
4 computer 21, the credit card account number which is to be  
5 debited the amount of the product.

6 As shown in figure 2C, in this embodiment, while maintaining  
7 linkage with the customer computer 21, the payment processing  
8 computer 23 establishes a link via phone lines 25 with the credit  
9 card server computer 24. The credit card account number and  
10 amount is communicated to the credit card server computer 24  
11 which responds to the payment processing computer 23 with an  
12 authorization indicia. This authorization indicia gives the  
13 acceptance or denial of the charge.

14 If a product is to be shipped, and if the charge has been  
15 authorized, as shown in figure 2D, the payment processing  
16 computer 23 connects with the merchant computer 22 and directs  
17 the merchant to ship the product to the consumer.

18 As shown in figure 2E, since the payment processing computer  
19 23 has identified the product number, it is able to retrieve from  
20 its memory the URL for reconnecting the customer computer 21 with  
21 the merchant computer 22. In this manner, the entire operation  
22 is totally transparent to the consumer since they feel they have  
23 been continuously working with the merchant computer 22.

24 Further, using the URL's from its memory, the payment  
25 processing computer 23 is able to link the customer computer 21

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1 to the merchant computer 22 at an address which is different from  
2 where the consumer was originally connected. In this manner, the  
3 payment processing computer 23 is able to direct the consumer to  
4 different locations which are consistent with the authorization  
5 indicia (accept/reject) on their credit card.

6 As example, assume, the credit card was authorized, then the  
7 consumer could be reconnected to an area which has restricted  
8 access so that the consumer can gain the information paid for; if  
9 on the other hand, the credit card was rejected, the connection  
10 would be to a page indicating such and possibly asking for  
11 another card number.

12 In this manner, the payment processing computer 23 is able  
13 to control the operation and interface between the customer  
14 computer 21 and the merchant computer 22.

15 Periodically, the payment processing computer 23 connects  
16 via the phone lines 25 with the credit card server 24 and  
17 instructs it to transfer the appropriate amount of funds to the  
18 merchant's bank computer 26 so that the merchant has access to  
19 the funds paid for his product/service provided to the consumer.

20 Figures 3A, 3B, 3C, and 3D are frontal views of one  
21 embodiment of a consumer's display screen.

22 Screen 30A is designed to provide the promotional  
23 information so that the consumer is attracted to purchase the  
24 product. In screen 30A is the name of the merchant company (XYZ  
25 CO.) 31, the name of the product (widget) 32, the price (\$14.95)

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1 33, and the part number (#10234) 34.

2 Also located on screen 30A is a software key 35 which allows  
3 the consumer to pay for the product. In this embodiment, by  
4 activating this software key 35 (typically through a click of the  
5 mouse), screen 30A is changed to screen 30B which is identical  
6 except that the software key 35 has been replaced with an order  
7 window 36.

8 Order window 36 allows the consumer to complete the  
9 necessary information to order the product. This includes the  
10 part number 37A, the amount 37B, and the credit card number 37C.  
11 When the consumer is ready, the software key "Send" 37D or the  
12 software key "Cancel" 37E is activated. In the case of a cancel,  
13 the screen returns to screen 30A.

14 In a "send" 37D, mode, the payment processing computer  
15 contacts the bank computer and determines if the credit card is  
16 valid and if the amount is available. If the charge is  
17 authorized, the screen changes to 30C in which the order window  
18 36 has been replaced with authorization window 38 which shows  
19 that the charge has been accepted 39A, the transaction no.  
20 (A1483) 39B, and the password ("GO") 39C which the consumer is to  
21 use with the merchant.

22 When this information has either been printed or committed  
23 to memory, the consumer activates software key 39D to "Proceed"  
24 to screen 30D. At this point, the consumer is able to enter the  
25 password 29 so that the restricted access is lifted. In the

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1 genealogy example, it is at this point the consumer gains access  
2 to the full report.

3 Figure 4A is a flow-chart of the preferred embodiment's  
4 payment processing operation.

5 After start 40A, a connection is made with the customer  
6 computer 41A and the encryption software is downloaded to the  
7 customer computer 41B. Encryption software is preferably used  
8 for transmittal of the credit card number so that the integrity  
9 of the card is not jeopardized.

10 The consumer computer then communicates, and the payment  
11 processing computer accepts, the account number, the amount, and  
12 the identification of the product or service, 42A. A connection  
13 is made with the credit card server 41C and the account number  
14 and amount is transmitted 41D to the credit card server over the  
15 established phone lines. In response to this query, the  
16 authorization data is received 42B and the connection with the  
17 credit card server 41E is broken.

18 A transaction indicia is generated 41F. This transaction  
19 indicia is not the authorization data but serves as an internal  
20 monitoring system for the payment processing computer so that the  
21 accounting is kept accurate.

22 From the memory, the password is withdrawn 41G for the  
23 product so ordered; and, the password and transaction indicia is  
24 transmitted to the customer computer 41H.

25 At this point, the connection with the customer computer is



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1 terminated 41I and the program stops 40B.

2 Figure 4B is a flow-chart of an alternative embodiment's  
3 payment processing operation.

4 After start 43A, the program connects with the customer  
5 computer 44A and at the same time obtains the merchant URL 45A.  
6 Using the merchant URL, the payment processing computer searches  
7 its memory and identifies the merchant number, the part number,  
8 and the purchase amount 44B.

9 The encryption software is downloaded into the customer  
10 computer 44C and the credit card account number is received 45.  
11 A connection is then made with the credit card server computer  
12 44D and the account number and the amount is transmitted 44E.  
13 This inquiry results in an authorization code 45C being received  
14 and the connection with the credit card server being broken 44F.

15 A check is then made to see if the credit card purchase was  
16 authorized 46A.

17 If the credit card purchase was denied, the URL to use for a  
18 rejection is withdrawn from memory 44G and the Customer computer  
19 is connected to the merchant computer at this URL 44H leaving the  
20 payment processing computer able to disconnect 44I and stop 43B.

21 Should the credit card purchase be accepted, 46A, then the  
22 program generates a transaction identification 44J. This  
23 transaction identification is stored along with the date, amount  
24 of purchase, and the merchant number 44K.

25 The password is retrieved from memory 44L and it, together

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1 with the transaction identification, is transmitted to the  
2 customer computer 44M.

3 From memory, the authorized URL is withdrawn 44N.

4 A determination, based upon stored data, is made as to the  
5 character of the product (service or goods) 46B. If the product  
6 relates to goods which are to be shipped, a shipping order  
7 including the transaction identification, the amount, the date,  
8 and address of the customer, is communicated to the merchant 44O  
9 to satisfy the order. If the product is a "service", the program  
10 skips to step 44P.

11 The customer computer is then connected to the authorized  
12 URL 44P and the connection with the customer computer is  
13 terminated 44Q allowing the program to stop 43C.

14 Figure 5 is a flow-chart of the operation of the merchant's  
15 computer.

16 After start 50A, the merchant computer connects with the  
17 customer computer 51A and communicates the promotional material  
18 52A. The password is received from the customer 52B and is  
19 checked to see if it is the correct password 53A.

20 If the password is incorrect, a determination is made on if  
21 it is the customer's first try 53B; if it is, then the customer  
22 is given another chance to enter the correct password 52B. If  
23 the customer has tried twice to enter the correct password, the  
24 connection with the customer is terminated 51C and the program  
25 stops 50C.

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1        If the password is correct, 53A, then the secure or  
2        restricted access data is communicated to the customer's computer  
3        51D and the connection with the customer's computer is terminated  
4        51B. The program then stops 50B.

5        In this manner, secure information is selectively  
6        transmitted to a customer's computer upon the presentation of a  
7        password.

8        It is clear from the foregoing that the present invention  
9        creates a highly improved system for acceptance and processing of  
10        payments over a distributed computer network.